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EXAMINER	
SHUMATE, ANTHONY R	
ART UNIT	PAPER NUMBER
1797	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/594,592	ORESTI ET AL.	
	Examiner	Art Unit	
	ANTHONY SHUMATE	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 February 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *15-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *15-28* is/are rejected.

7)☒ Claim(s) *15-26 and 28* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *28 September 2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 17 February 2010 has been entered.

Response to Amendment

2. The Amendment filed 17 February 2010 has been entered and fully considered.

3. Claims 15-28 are pending and have been fully considered.

Claim Objections

4. Claims 15-26 and 28 are objected to because of the following informalities:

Claim 15 has the phrase “compression units ejectors,” which is grammatically incorrect. Appropriate correction is required.

Specification

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant’s use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in

upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

(a) TITLE OF THE INVENTION.
(b) CROSS-REFERENCE TO RELATED APPLICATIONS.
(c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
(d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
(e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
(f) BACKGROUND OF THE INVENTION.
    (1) Field of the Invention.
    (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
(g) BRIEF SUMMARY OF THE INVENTION.
(h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
(i) DETAILED DESCRIPTION OF THE INVENTION.
(j) CLAIM OR CLAIMS (commencing on a separate sheet).
(k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
(l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

Content of Specification

(a) Title of the Invention: See 37 CFR 1.72(a) and MPEP § 606. The title of the invention should be placed at the top of the first page of the specification unless the title is provided in an application data sheet. The title of the invention should be brief but technically accurate and descriptive, preferably from two to seven words may not contain more than 500 characters.

(b) Cross-References to Related Applications: See 37 CFR 1.78 and MPEP § 201.11.

(c) Statement Regarding Federally Sponsored Research and Development: See MPEP § 310.

(d) The Names Of The Parties To A Joint Research Agreement: See 37 CFR 1.71(g).

(e) Incorporation-By-Reference Of Material Submitted On a Compact Disc: The specification is required to include an incorporation-by-reference of electronic documents that are to become part of the permanent United States Patent and Trademark Office records in the file of a patent application. See 37 CFR 1.52(e) and MPEP § 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text were permitted as electronic documents on compact discs beginning on September 8, 2000.

(f) Background of the Invention: See MPEP § 608.01(c). The specification should set forth the Background of the Invention in two parts:

(1) Field of the Invention: A statement of the field of art to which the invention pertains. This statement may include a paraphrasing of the applicable U.S. patent classification definitions of the subject matter of the claimed invention. This item may also be titled "Technical Field."

(2) Description of the Related Art including information disclosed under 37 CFR 1.97 and 37 CFR 1.98: A description of the related art known to the applicant and including, if applicable, references to specific related art and problems involved in the prior art which are solved by the applicant's invention. This item may also be titled "Background Art."

(g) Brief Summary of the Invention: See MPEP § 608.01(d). A brief summary or general statement of the invention as set forth in 37 CFR 1.73. The summary is separate and distinct from the abstract and is directed toward the invention rather than the disclosure as a whole. The summary may point out the advantages of the invention or how it solves problems previously existent in the prior art (and preferably indicated in the Background of the Invention). In chemical cases it should point out in general terms the utility of the invention. If possible, the nature and gist of the invention or the inventive concept should be set forth. Objects of the invention should be treated briefly and only to the extent that they contribute to an understanding of the invention.

(h) Brief Description of the Several Views of the Drawing(s): See MPEP § 608.01(f). A reference to and brief description of the drawing(s) as set forth in 37 CFR 1.74.

(i) Detailed Description of the Invention: See MPEP § 608.01(g). A description of the preferred embodiment(s) of the invention as required in 37 CFR 1.71. The description should be as short and specific as is necessary to describe the invention adequately and accurately. Where

elements or groups of elements, compounds, and processes, which are conventional and generally widely known in the field of the invention described and their exact nature or type is not necessary for an understanding and use of the invention by a person skilled in the art, they should not be described in detail. However, where particularly complicated subject matter is involved or where the elements, compounds, or processes may not be commonly or widely known in the field, the specification should refer to another patent or readily available publication which adequately describes the subject matter.

(j) Claim or Claims: See 37 CFR 1.75 and MPEP § 608.01(m). The claim or claims must commence on separate sheet or electronic page (37 CFR 1.52(b)(3)). Where a claim sets forth a plurality of elements or steps, each element or step of the claim should be separated by a line indentation. There may be plural indentations to further segregate subcombinations or related steps. See 37 CFR 1.75 and MPEP § 608.01(i)-(p).

(k) Abstract of the Disclosure: See MPEP § 608.01(f). A brief narrative of the disclosure as a whole in a single paragraph of 150 words or less commencing on a separate sheet following the claims. In an international application which has entered the national stage (37 CFR 1.491(b)), the applicant need not submit an abstract commencing on a separate sheet if an abstract was published with the international application under PCT Article 21. The abstract that appears on the cover page of the pamphlet published by the International Bureau (IB) of the World Intellectual Property Organization (WIPO) is the abstract that will be used by the USPTO. See MPEP § 1893.03(e).

(l) Sequence Listing, See 37 CFR 1.821-1.825 and MPEP §§ 2421-2431. The requirement for a sequence listing applies to all sequences disclosed in a given application, whether the sequences are claimed or not. See MPEP § 2421.02.

Claim Rejections - 35 USC § 101

5. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 25 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 25 provides for the use of recompressed gases exiting from the compression units as fuel gases, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claim 25 is rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd.* v. *Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 15-26 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over SANDS et al. (US 4,778,443) in view of AAREBROT et al. (WO 2000/011313), HOLM (US 3,075,918) and LAGRONE (US 4,339,917).

For instant **claims 15 and 17**, SANDS et al. teaches at the abstract, column 6 lines 1-40, figure 1 and claim 1 delivering the gas/oil/water (fluid) from the offshore facility (field) to a high pressure gas/liquids separation stage.

Also for instant **claims 15 and 17**, SANDS et al. teaches at the abstract, column 6 lines 1-40, figure 1 and claim 1 where the gas/oil/water (fluid) is split into a gas phase substantially consisting of petroleum gases (light hydrocarbon).

Additionally for instant **claims 15 and 17**, SANDS et al. teaches at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1, oil/water (two liquid phases) one of which mainly consists of water, the other substantially of oil (hydrocarbon liquids).

In addition for instant **claims 15 and 17**, SANDS et al. does not teach delivering the light hydrocarbon gases, separated in the high pressure separation stage, to a reinjection gas compression unit having at least two compression stages. AAREBROT et al. teaches at page 1 lines 15-20, page 4 lines 1-30, figure 1, and figure 2 delivering oil associated gases (light hydrocarbon gases), to a reinjection gas compression unit having at least two compression stages (C_1-C_5). It would have been obvious to one having ordinary skill in the art at the time the invention was made to process the petroleum (oil) gas of SANDS et al. with the reinjection system of AAREBROT et al., in order to retain the pressure of the

reservoir in order to facilitate the oil recovery as taught by AAREBROT et al. at page 1 lines 15-20.

Also for instant **claims 15 and 17**, SANDS et al. does not specifically teach delivering, **after heating**, the hydrocarbon liquid separated in the high pressure stage of separation to one or more further stages of gas/liquids separation operating at decreasing pressures. But for instant claim 15, SANDS et al. does teach at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1, delivering the oil (hydrocarbon liquid) separated in the high pressure stage of separation to one or more further stages of gas/liquids separation operating at medium-pressure and low-pressure (decreasing pressures). It would have been obvious to one having ordinary skill in the art at the time the invention was made to heat the hydrocarbon liquid, since it was known in the art that heating of petroleum oil (hydrocarbon liquid) provides the benefit of causing the dissolved carbon dioxide to be desorbed from the petroleum oil to help in flashing off the carbon dioxide from the hydrocarbon oil as taught by HOLM at column 2 lines 35-50.

Furthermore for instant **claims 15 and 17**, SANDS et al. does teach at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1 where, in each stage, the oil and water with dissolved gas (liquid) is split into a gas phase essentially consisting of petroleum gases (light hydrocarbon), and oil/water (two liquid phases) one of which mainly consists of water, the other mainly of oil (hydrocarbon liquids).

What's more for instant **claims 15 and 17**, SANDS et al. does teach at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1 delivering to a centrifugal countercurrent liquid/liquid contactor (water treatment section) the water separated both in the first high pressure separation stage and in the medium-pressure and low-pressure (decreasing pressures) separation stages.

Still more for instant **claims 15 and 17**, SANDS et al. does teach at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1 delivering the petroleum gases (light hydrocarbon), which have been separated in the medium-pressure and low-pressure (decreasing pressure) separation stages to corresponding compression units (5 and 6) to recompress the gases.

As well for instant **claims 15 and 17**, SANDS et al. teaches at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1 using compressors (5 and 6) to compress gases, except SANDS et al. does not specifically teach **(1)** the ejector type of compressor, and **(2)** the compressed gas exiting from the one of a plurality of compression stages of the reinjection gas compression unit as a driving fluid of each single ejector. It would have been obvious to one having ordinary skill in the art at the time the invention was made to **(1)** use ejectors as the type of compressor, since LAGRONE teaches at column 1 lines 5-30 it is known that utilization of an ejector pump improves the suction capability of a fluid delivery system.

Also for instant **claims 15 and 17**, LAGRONE teaches the technique at column 1 lines 45-68, column 2 lines 15-50 and figure 1 **(2)** the compressed gas exiting from a compression stage of the centrifugal pump (compression unit) as the fluid directed to (driving fluid) the ejector. Also, AAREBROT et al. teaches at page 1 lines 15-20, page 4 lines 1-30, figure 1, figure 2 using a reinjection gas compression unit discussed above in order to retain the pressure of the reservoir in order to facilitate the oil recovery. Also, AAREBROT et al. teaches at the figures and page 2 lines 30-32 a plurality of compression stages (C_1-C_5) of the reinjection gas compression unit. Also, the (compression unit) taught by LAGRONE is similar to the compression unit taught by AAREBROT et al. Furthermore, AAREBROT et al. teaches at the abstract, page 1 lines 15-20, page 4 lines 1-30, figure 1, figure 2 the reinjection gas compression unit produces exhaust. It would have been obvious to one having ordinary skill in the art at the time the invention was made to combining the prior art elements according to the known technique taught by LAGRONE to the base device taught by SANDS et al. and modified by AAREBROT et al. and HOLM in order to provide the predictable result of improving the suction capability of a fluid delivery system as taught by LAGRONE at column 1 lines 15-25.

For instant **claim 16, 18 and 19**, SANDS et al. does not specifically teach wherein the driving fluid of each single ejector is the compressed gas exiting from a second-last or from a last compression stage of the reinjection gas

compression unit. It would have been obvious to one having ordinary skill in the art at the time invention was made to wherein the driving fluid of each single ejector is the compressed gas exiting from a last compression stage of the reinjection gas compression unit, since it has been held that rearranging parts of an invention involves only routine skill in the art. (MPEP 2144.04 VI-C)

Alternatively, it would have been obvious to one having ordinary skill in the art at the time invention was made to try wherein the driving fluid of each single ejector is the compressed gas exiting from a last compression stage of the reinjection gas compression unit, since there was a finite number of identified predictable solutions.

For instant **claim 20**, SANDS et al. does not teach wherein each stage of compression of the reinjection gas compression unit comprises at least a biphasic separator to remove liquid particles, a compressor, and a heat exchanger to cool the compressed gas. But, AAREBROT et al. teaches at the abstract, page 1 lines 15-20, page 4 lines 1-30, page 2 lines 25-32, figure 1, and figure 2 wherein each stage of compression (C_1-C_5) of the reinjection gas compression unit comprises at least a condensed water separator (biphasic separator to remove liquid particles)(U), a compressor (C_1-C_5), and a intercooler (heat exchanger)(K_2-K_6) to cool the compressed gas. It would have been obvious to one having ordinary skill in the art at the time the invention was made to process the petroleum (oil) gas of SANDS et al. with the reinjection system of

AAREBROT et al., in order to retain the pressure of the reservoir in order to facilitate the oil recovery as taught by AAREBROT et al. at page 1 lines 15-20.

For instant **claims 21 and 22**, SANDS et al. does not teach wherein **(1)** the compressed gas to be used as driving fluid is taken after the compressor **(2)** and before the cooling heat exchanger. But, LAGRONE teaches the technique at column 1 lines 45-68, column 2 lines 15-50 and figure 1 wherein the compressed gas to be used as directed fluid (driving fluid) is taken after the centrifugal pump (compressor). AAREBROT et al. teaches at page 1 lines 15-20, page 4 lines 1-30, figure 1, figure 2 using a reinjection gas compression unit as discussed above for the obviousness to one of ordinary skill in the art of in order to retain the pressure of the reservoir in order to facilitate the oil recovery. Also, the (compression unit) taught by LAGRONE is similar to the compression unit taught by AAREBROT et al. Furthermore, AAREBROT et al. teaches at the abstract, page 1 lines 15-20, page 4 lines 1-30, figure 1, figure 2 the reinjection gas compression unit produces exhaust.

For instant **claims 21 and 22,** it would have been obvious to one having ordinary skill in the art at the time invention was made to wherein the compressed gas to be used as driving fluid is taken after the compressor **(2)** before the cooling heat exchanger, since it has been held that rearranging parts of an invention involves only routine skill in the art. (MPEP 2144.04 VI-C)

Alternatively, it would have been obvious to one having ordinary skill in the art at the time invention was made to try wherein the compressed gas to be used as driving fluid is taken after the compressor **(2)** before the cooling heat exchanger, since there was a finite number of identified predictable solutions.

For instant **claim 23**, SANDS et al. does not teach wherein the reinjection gas compression unit includes three compression stages. But, AAREBROT et al. teaches at the abstract, page 1 lines 15-20, page 4 lines 1-30, page 2 lines 25-32, figure 1, and figure 2 wherein the reinjection gas compression unit includes three compression stages (C_1-C_3). It would have been obvious to one having ordinary skill in the art at the time the invention was made to process the petroleum (oil) gas of SANDS et al. with the reinjection system of AAREBROT et al., in order to retain the pressure of the reservoir in order to facilitate the oil recovery as taught by AAREBROT et al. at page 1 lines 15-20.

For instant **claim 24**, SANDS et al. teaches at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1 wherein the last stage of separation at decreasing pressures is performed at 450 kPa (pressure). SANDS et al. does not teach the last stage of separation at decreasing pressures is performed at sub-atmospheric pressure. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the last stage of separation at decreasing pressures is performed

at sub-atmospheric pressure, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (MPEP 2144.05 PART II-A)

For instant **claim 25**, SANDS et al. teaches at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1 wherein the recompressed gases exiting from the compression units (5 and 6) are used as petroleum gas to a pipeline (i.e. fuel gases).

For instant **claim 26**, SANDS et al. does not teach wherein the recompressed gases exiting the compression units are sent to the reinjection gas compression unit. AAREBROT et al. teaches at page 1 lines 15-20, page 4 lines 1-30, figure 1, and figure 2 delivering oil associated gases (light hydrocarbon gases), to a reinjection gas compression unit having at least two compression stages (C_1-C_5). It would have been obvious to one having ordinary skill in the art at the time the invention was made to process the petroleum (oil) gas of SANDS et al. with the reinjection system of AAREBROT et al., in order to retain the pressure of the reservoir in order to facilitate the oil recovery as taught by AAREBROT et al. at page 1 lines 15-20.

For instant **claim 28**, SANDS et al. teaches at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1, claim 1 and claim 13 the system is performed in a floating production unit.

10. Alternatively, claims 15-26 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over SANDS et al. (US 4,778,443) in view of AAREBROT et al. (WO 2000/011313), HOLM (US 3,075,918), CHOI et al. (US 6,537,349 B2) and LAGRONE (US 4,339,917), and evidenced by WEBB (US 5,195,587) and JOHNSTON (US 4,967,559).

For instant **claims 15 and 17**, SANDS et al. teaches at the abstract, column 6 lines 1-40, figure 1 and claim 1 delivering the gas/oil/water (fluid) from the offshore facility (field) to a high pressure gas/liquids separation stage (1).

Also for instant **claims 15 and 17**, SANDS et al. teaches at the abstract, column 6 lines 1-40, figure 1 and claim 1 where the gas/oil/water (fluid) is split into a gas phase substantially consisting of petroleum gases (light hydrocarbon).

Additionally for instant **claims 15 and 17**, SANDS et al. teaches at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1, oil/water (two liquid phases) one of which mainly consists of water, the other substantially of oil (hydrocarbon liquids).

In addition for instant **claims 15 and 17**, SANDS et al. does not teach delivering the light hydrocarbon gases, separated in the high pressure separation stage, to a reinjection gas compression unit having at least two compression

stages. AAREBROT et al. teaches at page 1 lines 15-20, page 4 lines 1-30, figure 1, and figure 2 delivering oil associated gases (light hydrocarbon gases), to a reinjection gas compression unit having at least two compression stages (C_1-C_5). It would have been obvious to one having ordinary skill in the art at the time the invention was made to process the petroleum (oil) gas of SANDS et al. with the reinjection system of AAREBROT et al., in order to retain the pressure of the reservoir in order to facilitate the oil recovery as taught by AAREBROT et al. at page 1 lines 15-20.

Also for instant **claims 15 and 17**, SANDS et al. does not specifically teach delivering, **after heating**, the hydrocarbon liquid separated in the high pressure stage of separation to one or more further stages of gas/liquids separation operating at decreasing pressures. But for instant claim 15, SANDS et al. does teach at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1, delivering the oil (hydrocarbon liquid) separated in the high pressure stage (1) of separation to further stages (3 and 4) of gas/liquids separation operating at medium-pressure and low-pressure (decreasing pressures). It would have been obvious to one having ordinary skill in the art at the time the invention was made to heat the hydrocarbon liquid, since it was known in the art that heating of petroleum oil (hydrocarbon liquid) provides the benefit of causing the dissolved carbon dioxide to be desorbed from the petroleum oil to help in flashing off the carbon dioxide from the hydrocarbon oil as taught by HOLM at column 2 lines 35-50.

Furthermore for instant **claims 15 and 17**, SANDS et al. does teach at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1 where, in each stage (3 and 4), the oil and water with dissolved gas (liquid) is split into a gas phase essentially consisting of petroleum gases (light hydrocarbon), and oil/water (two liquid phases) one of which mainly consists of water, the other mainly of oil (hydrocarbon liquids).

What's more for instant **claims 15 and 17**, SANDS et al. does teach at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1 delivering to a centrifugal countercurrent liquid/liquid contactor (water treatment section) the water separated both in the first high pressure separation stage and in the medium-pressure and low-pressure (decreasing pressures) separation stages.

Still more for instant **claims 15 and 17**, SANDS et al. does teach at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1 delivering the petroleum gases (light hydrocarbon), which have been separated in the medium-pressure and low-pressure (decreasing pressure) separation stages to corresponding compression units (5 and 6) to recompress the gases.

As well for instant **claims 15 and 17**, SANDS et al. teaches at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1 using compressors (5 and 6) to compress gases, except SANDS et al. does not specifically teach **(1)** the ejector type of compressor, and **(2)** the

compressed gas exiting from the one of a plurality of compression stages of the reinjection gas compression unit as a driving fluid of each single ejector. Also, CHOI et al. teaches at the abstract and the figures a subsea flash gas compression system with an ejector (14) for compressing low pressure gas with a high pressure input. LAGRONE teaches at column 1 lines 5-30 it is known that utilization of an ejector pump improves the suction capability of a fluid delivery system. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide **(1)** the ejector of CHOI et al. as the type of compressors, since LAGRONE teaches at column 1 lines 5-30 it is known that utilization of an ejector pump improves the suction capability of a fluid delivery system.

Alternatively, LAGRONE teaches at column 1 lines 5-30 prior art systems become cumbersome and relatively expensive due to utilization of electrical power for one or more fuel pumps. It would have been obvious to one having ordinary skill in the art at the time the invention was made to **(1)** the ejector of CHOI et al. as the type of compressors for the benefit of not utilizing electrical power.

Also for instant **claims 15 and 17**, LAGRONE teaches the technique at column 1 lines 45-68, column 2 lines 15-50 and figure 1 **(2)** the compressed gas exiting from a compression stage of the centrifugal pump (compression unit) as the fluid directed to (driving fluid) the ejector. Also, AAREBROT et al. teaches at page 1 lines 15-20, page 4 lines 1-30, figure 1, figure 2 using a reinjection gas

compression unit discussed above in order to retain the pressure of the reservoir in order to facilitate the oil recovery. Also, AAREBROT et al. teaches at the figures and page 2 lines 30-32 a plurality of compression stages (C_1-C_5) of the reinjection gas compression unit. Also, the non-ejector type compression unit taught by LAGRONE is similar to the non-ejector type compression unit taught by AAREBROT et al. Furthermore, AAREBROT et al. teaches at the abstract, page 1 lines 15-20, page 4 lines 1-30, figure 1, figure 2 the reinjection gas compression unit produces exhaust. It would have been obvious to one having ordinary skill in the art at the time the invention was made to combining the prior art elements according to the known technique taught by LAGRONE to the base device taught by SANDS et al. modified with CHOI et al., HOLM and AAREBROT et al. in order to provide the predictable result of improving the suction capability of a fluid delivery system as taught by LAGRONE at column 1 lines 15-25.

Alternatively, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combining the prior art elements according to the known technique taught by LAGRONE to the base device taught by SANDS et al. modified with CHOI et al., HOLM and AAREBROT et al. for the benefit of not utilizing electrical power.

[WEBB (US 5,195,587) provides extrinsic evidence at the abstract and the figures an oil field production system with an ejector (43). Also, WEBB (US 5,195,587) provides extrinsic evidence at the figures and column 4 lines 50-55

passing the gas entrained water from an ejector into a reinjection system for injecting these fluids into an underground formation.]

[JOHNSTON (US 4,967,559) provides extrinsic evidence at the title and the figures a geothermal power plant with well reinjection (i.e. a reinjection system). Also, JOHNSTON provides extrinsic evidence at column 4 lines 64-67 of steam jet gas ejectors used; and steam jet gas ejectors are an alternative to mechanical gas compressors to compress gases.]

For instant **claim 16, 18 and 19**, SANDS et al. does not specifically teach wherein the driving fluid of each single ejector is the compressed gas exiting from a second-last or from a last compression stage of the reinjection gas compression unit. It would have been obvious to one having ordinary skill in the art at the time invention was made to wherein the driving fluid of each single ejector is the compressed gas exiting from a last compression stage of the reinjection gas compression unit, since it has been held that rearranging parts of an invention involves only routine skill in the art. (MPEP 2144.04 VI-C)

Alternatively, it would have been obvious to one having ordinary skill in the art at the time invention was made to try wherein the driving fluid of each single ejector is the compressed gas exiting from a last compression stage of the reinjection gas compression unit, since there was a finite number of identified predictable solutions.

For instant **claim 20**, SANDS et al. does not teach wherein each stage of compression of the reinjection gas compression unit comprises at least a biphasic separator to remove liquid particles, a compressor, and a heat exchanger to cool the compressed gas. But, AAREBROT et al. teaches at the abstract, page 1 lines 15-20, page 4 lines 1-30, page 2 lines 25-32, figure 1, and figure 2 wherein each stage of compression (C_1-C_5) of the reinjection gas compression unit comprises at least a condensed water separator (biphasic separator to remove liquid particles)(U), a compressor (C_1-C_5), and a intercooler (heat exchanger)(K_2-K_6) to cool the compressed gas. It would have been obvious to one having ordinary skill in the art at the time the invention was made to process the petroleum (oil) gas of SANDS et al. with the reinjection system of AAREBROT et al., in order to retain the pressure of the reservoir in order to facilitate the oil recovery as taught by AAREBROT et al. at page 1 lines 15-20.

For instant **claims 21 and 22**, SANDS et al. does not teach wherein **(1)** the compressed gas to be used as driving fluid is taken after the compressor **(2)** and before the cooling heat exchanger. But, LAGRONE teaches the technique at column 1 lines 45-68, column 2 lines 15-50 and figure 1 wherein the compressed gas to be used as directed fluid (driving fluid) for the ejector is taken after the centrifugal pump (compressor). AAREBROT et al. teaches at page 1 lines 15-20, page 4 lines 1-30, figure 1, figure 2 using a reinjection gas compression unit as discussed above for the obviousness to one of ordinary skill in the art of in

order to retain the pressure of the reservoir in order to facilitate the oil recovery. Also, the non-ejector compression unit taught by LAGRONE is similar to the non-ejector compression unit taught by AAREBROT et al. Furthermore, AAREBROT et al. teaches at the abstract, page 1 lines 15-20, page 4 lines 1-30, the figures particularly figures 1 and 2 the reinjection gas compression unit produces exhaust, and has a cooling heat exchanger (K_6).

For instant **claims 21 and 22,** it would have been obvious to one having ordinary skill in the art at the time invention was made to wherein the compressed gas to be used as driving fluid is taken after the compressor **(2)** before the cooling heat exchanger, since it has been held that rearranging parts of an invention involves only routine skill in the art. (MPEP 2144.04 VI-C)

Alternatively, it would have been obvious to one having ordinary skill in the art at the time invention was made to try wherein the compressed gas to be used as driving fluid is taken after the compressor **(2)** before the cooling heat exchanger, since there was a finite number of identified predictable solutions.

For instant **claim 23**, SANDS et al. does not teach wherein the reinjection gas compression unit includes three compression stages. But, AAREBROT et al. teaches at the abstract, page 1 lines 15-20, page 4 lines 1-30, page 2 lines 25-32, figure 1, and figure 2 wherein the reinjection gas compression unit includes three compression stages (C_1-C_3). It would have been obvious to one having ordinary skill in the art at the time the invention was made to process the

petroleum (oil) gas of SANDS et al. with the reinjection system of AAREBROT et al., in order to retain the pressure of the reservoir in order to facilitate the oil recovery as taught by AAREBROT et al. at page 1 lines 15-20.

For instant **claim 24**, SANDS et al. teaches at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1 wherein the last stage of separation at decreasing pressures is performed at 450 kPa (pressure). SANDS et al. does not teach the last stage of separation at decreasing pressures is performed at sub-atmospheric pressure. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the last stage of separation at decreasing pressures is performed at sub-atmospheric pressure, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (MPEP 2144.05 PART II-A)

For instant **claim 25**, SANDS et al. teaches at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1 wherein the recompressed gases exiting from the compression units (5 and 6) are used as petroleum gas to a pipeline (fuel gases).

For instant **claim 26**, SANDS et al. does not teach wherein the recompressed gases exiting the compression units are sent to the reinjection gas

compression unit. But, SANDS et al. teaches at the figures and the abstract gases (i.e. recompressed gases) exiting the compression units (5 and 6). Also, AAREBROT et al. teaches at page 1 lines 15-20, page 4 lines 1-30, figure 1, and figure 2 delivering oil associated gases (light hydrocarbon gases), to a reinjection gas compression unit having at least two compression stages (C_1-C_5). It would have been obvious to one having ordinary skill in the art at the time the invention was made to process the petroleum (oil) gas of SANDS et al. with the reinjection system of AAREBROT et al., in order to retain the pressure of the reservoir in order to facilitate the oil recovery as taught by AAREBROT et al. at page 1 lines 15-20.

For instant **claim 28**, SANDS et al. teaches at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1, claim 1 and claim 13 the system is performed in a floating production unit.

11. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over SANDS et al. (US 4,778,443) in view of AAREBROT et al. (WO 2000/011313) and LAGRONE (US 4,339,917).

For instant **claim 27**, SANDS et al. teaches at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1, claim 1 and claim 13 a treatment system for gas/oil/water (fluid) originating from an oil field,

a high pressure separator and at least a second lower pressure (medium-pressure) separator.

For instant **claim 27**, SANDS et al. teaches at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1, claim 1 and claim 13 petroleum (oil) associated gases. Except, SANDS et al. does not teach one reinjection gas compression unit having at least two compression stages. But, AAREBROT et al. teaches at page 1 lines 15-20, page 4 lines 1-30, figure 1, and figure 2 delivering oil associated gases (light hydrocarbon gases), to a reinjection gas compression unit having at least two compression stages (C_1-C_5). It would have been obvious to one having ordinary skill in the art at the time the invention was made to process the petroleum (oil) gas of SANDS et al. with the reinjection system of AAREBROT et al., in order to retain the pressure of the reservoir in order to facilitate the oil recovery as taught by AAREBROT et al. at page 1 lines 15-20.

For instant **claim 27**, SANDS et al. does teach at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1, claim 1 and claim 13 at least a compression unit (5 and 6). For instant **claim 27**, SANDS et al. does not teach at least a compression unit equipped with a suitable ejector. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use ejectors as the type of compressor, since LAGRONE teaches at column 1 lines 5-30 it is known that utilization of an ejector pump improves the suction capability of a fluid delivery system.

12. Alternatively, Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over SANDS et al. (US 4,778,443) in view of AAREBROT et al. (WO 2000/011313), CHOI et al. (US 6,537,349 B2) and LAGRONE (US 4,339,917) and evidenced by WEBB (US 5,195,587) and JOHNSTON (US 4,967,559).

For instant **claim 27**, SANDS et al. teaches at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1, claim 1 and claim 13 a treatment system for gas/oil/water (fluid) originating from an oil field, a high pressure separator (1) and a second lower pressure (medium-pressure) separator (3).

For instant **claim 27**, SANDS et al. teaches at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1, claim 1 and claim 13 petroleum (oil) associated gases. Except, SANDS et al. does not teach one reinjection gas compression unit having at least two compression stages. But, AAREBROT et al. teaches at page 1 lines 15-20, page 4 lines 1-30, figure 1, and figure 2 delivering oil associated gases (light hydrocarbon gases), to a reinjection gas compression unit having at least two compression stages (C_1-C_5). It would have been obvious to one having ordinary skill in the art at the time the invention was made to process the petroleum (oil) gas of SANDS et al. with the reinjection system of AAREBROT et al., in order to retain the pressure of the reservoir in order to facilitate the oil recovery as taught by AAREBROT et al. at page 1 lines 15-20.

For instant **claim 27**, SANDS et al. does teach at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1, claim 1 and claim 13 a compression unit (5 and 6). Also, SANDS et al. does not teach at least a compression unit equipped with a suitable ejector. But, CHOI et al. teaches at the abstract and the figures a subsea flash gas compression system with an ejector (14) for compressing gas. LAGRONE teaches at column 1 lines 5-30 it is known that utilization of an ejector pump improves the suction capability of a fluid delivery system. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the ejector of CHOI et al. as the compression unit, since LAGRONE teaches at column 1 lines 5-30 it is known that utilization of an ejector pump improves the suction capability of a fluid delivery system.

Alternatively, LAGRONE teaches at column 1 lines 5-30 prior art systems become cumbersome and relatively expensive due to utilization of electrical power for one or more fuel pumps. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the ejector of CHOI et al. as the compression unit for the benefit of not utilizing electrical power.

[WEBB (US 5,195,587) provides extrinsic evidence at the abstract and the figures an oil field production system with an ejector (43). Also, WEBB (US 5,195,587) provides extrinsic evidence at the figures and column 4 lines 50-55

passing the gas entrained water from an ejector into a reinjection system for injecting these fluids into an underground formation.]

[JOHNSTON (US 4,967,559) provides extrinsic evidence at the title and the figures a geothermal power plant with well reinjection (i.e. a reinjection system). Also, JOHNSTON provides extrinsic evidence at column 4 lines 64-67 of steam jet gas ejectors used; and steam jet gas ejectors are an alternative to mechanical gas compressors to compress gases.]

Examiner Notes

13. The Examiner notes that the Applicant described in the interview on 23 February 2010 that they did not have a problem with the combination of SANDS et al. (US 4,778,443) with AAREBROT et al. (WO 2000/011313).

14. Also, the Examiner notes that the Applicant described in the interview on 23 February 2010 that applicant's instant disclosure disclosed that the driving fluid maybe taken from anyone of the compression stages.

Response to Arguments

15. Applicant's arguments filed 17 February 2010 have been fully considered but they are not persuasive.

16. Applicant argues at page 7 paragraph 2 "LAGRONE does not teach selecting a driving gas from a compression step in a gas reinjection system as recited in the present claims." The Examiner assumes that the Applicant is describing "compression stages", not "compression steps." Also, it is respectively noted that claim 15 does not explicitly recite, "selecting a driving gas from a compression step in a gas reinjection system," or "selecting a driving gas from a compression stage in a gas reinjection system."

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant states at page 7 paragraph 2 "none of the cited references disclose or suggest a gaseous driving fluid exiting from one of the compression steps of a gas reinjection compression unit." The Examiner assumes that the Applicant is describing "compression stages", not "compression steps." The Examiner respectively disagrees. AAREBROT et al. teaches at the figures and the abstract a gaseous fluid (i.e. gaseous driving fluid) exiting from the last compression stage of a gas reinjection compression unit.

17. Applicant argues "col. 3, lines 47-52 emphasizing the importance of the low temperature fluid into the ejector improving the vapor-to-liquid ratio of up to 0.5. In contrast, for example, in the preferred embodiment of the present invention (see, for example, claim 22), the driving gas is taken before it is cooled." Respectively, the Examiner disagrees that the Applicant's invention has the contrast of the driving gas being taken before it is cooled. Figure 1 clearly shows the compressed gas cooled twice prior to being directed towards the ejectors.

18. Applicant argues LAGRONE requires at least 50% liquid in the ejector. Respectively, the Examiner does not find the Applicant's argument persuasive. Respectively, the Applicant fails to particularly show that LAGRONE requires at least 50% liquid in the ejector.

19. Applicant argues that a person of ordinary skill in marine oil fields would not look to the field of fuel systems for guidance. Respectively, the Examiner does not find the Applicant's argument persuasive. The Examiner notes claim 25 has the phrase, "wherein the recompressed gases exiting from the compression units are used as **fuel** gases." (emphasis added by bolding)

20. Applicant argues that SANDS et al. teaches away from adding the multiple compressor system of AAREBROT et al. and additional ejectors of LAGRONE. Respectively, the Examiner does not find the Applicant's argument persuasive.

Respectively, the Applicant fails to particularly show that LAGRONE teaches away from adding the multiple compressor system of AAREBROT et al. and additional ejectors of LAGRONE.

21. Applicant argues "none of the cited references disclose [sic] using a different composition to drive an ejector as claimed." Respectively, the Examiner does not find the Applicant's argument persuasive. Applicant's argument is not commensurate in scope with the claims.

22. In response to any remaining argument(s) not already addressed, absent any further teaching as to why or how the previously claimed limitation(s) are absent from the reference(s) the Examiner does not find the argument(s) persuasive and maintains the rejection(s).

Conclusion

23. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. SCOTT et al. (US 6,134,951) 24 October 2000 Method and Apparatus for Determining the Water Content of an Oil Stream.

b. LA MORI et al. (US 4,528,169) 9 July 1985 Process to Abate Geothermal Hydrogen Sulfide.

c. RICHENBERG et al. "Ejectors, Steam Jet" of Encyclopedia of Chemical Processing and Design, vol 17, pages 167-194, 1976, Marcel Dekker, Inc.

24. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTHONY SHUMATE whose telephone number is (571)270-5546. The examiner can normally be reached on M-Th 9-4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Marcheschi can be reached on (571)272-1374. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A.S./
Examiner Art Unit 1797

/Jason M. Greene/
Primary Examiner, Art Unit 1797